IAPMO/ANSI S1001.4-2015(R2020)

Energy Production Rating of Solar Heating Collectors

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Preface

This is the first edition of IAPMO S1001.4, *Energy Production Rating of Solar Heating Collectors*.

This Standard was developed by the IAPMO S1001 Technical Subcommittee and approved by the IAPMO Solar Standards Committee in accordance with the *ANSI Essential Requirements: Due process requirements for American National Standards* and the *IAPMO Policies and Procedures for Consensus Development of American National Standards*. This Standard was approved as an American National Standard on June 17, 2015.

Notes:

(1) The use of the singular does not exclude the plural (and vice versa) when the sense allows.

(2) This standard was developed in accordance with the IAPMO procedures accredited as meeting the criteria for American National Standards and it is an American National Standard. The IAPMO Standards Committee that approved this Standard was balanced to assure that individuals from competent and concerned interests had an opportunity to participate. During its development, this Standard was made available for public review, thus providing an opportunity for additional input from industry, academia, regulatory agencies, and the public at large.

(3) This Standard was developed by consensus, which is defined as substantial agreement; consensus implies much more than a simple majority, but not necessarily unanimity. It is consistent with this definition that a member of the relevant IAPMO Standards Committee can be included in the committee roster and yet not be in full agreement with all sections of this Standard.

(4) Although the intended primary application of this Standard is stated in its scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.

(5) IAPMO Standards are subject to periodic review and suggestions for their improvement will be referred to the relevant IAPMO Standards Committee. To submit a proposal for change to this Standard, you may send the following information to the International Association of Plumbing and Mechanical Officials, Attention Standards Department, at standards@IAPMOstandards.org or, alternatively, at 5001 East Philadelphia Street, Ontario, California, 91761, and include "Proposal for change" in the subject line:

- *(a) standard designation (number);*
- *(b) relevant section, table, or figure number, as applicable;*
- *(c) wording of the proposed change, tracking the changes between the original and the proposed wording; and*
- *(d) rationale for the change.*

(6) Requests for interpretation should be clear and unambiguous. To submit a request for interpretation of this Standard, you may send the following information to the International Association of Plumbing and Mechanical Officials, Attention Standards Department, at standards@IAPMOstandards.org or, alternatively, at 5001 East Philadelphia Street, Ontario, California, 91761, and include "Request for interpretation" in the subject line:

- *(a) the edition of the standard for which the interpretation is being requested;*
- *(b) the definition of the problem, making reference to the specific section and, when appropriate, an illustrative sketch explaining the question;*
- *(c) an explanation of circumstances surrounding the actual field conditions; and*
- *(d) the request for interpretation phrased in such a way that a "yes" or "no" answer will address the issue.*

(7) Interpretations are processed in accordance with IAPMO's accredited standards development procedures. IAPMO issues written replies to inquiries concerning interpretation of technical aspects of this Standard.

(8) IAPMO accepts responsibility only for those interpretations of this Standard issued in accordance with the accredited IAPMO policies and procedures, which precludes the issuance of interpretations by individuals.

(9) IAPMO does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity.

(10) Attention is drawn to the possibility that some of the elements of this Standard may be the subject of patent rights. IAPMO is not to be held responsible for identifying any or all such patent rights. Users of this Standard are expressly advised that determination of the validity of any such patent rights is entirely their responsibility.

(11) IAPMO does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this Standard, and does not undertake to insure anyone utilizing this Standard against liability for infringement of any applicable patents, nor assumes any such liability. Users of this Standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their responsibility.

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IAPMO/ANSI S1001.4-2015
Energy Production Rating of Solar Heating Collectors

1 Scope

1.1
This Standard specifies the procedures used to determine the energy production rating of solar heating collectors.

Notes:

1) The purpose of energy production ratings is to
   (a) provide a basis for comparing the relative thermal performance of various solar collector technologies when evaluated under the same rating conditions; and
   (b) help users of solar heating collectors make an informed decision regarding the choice of technology with respect to thermal performance.
2) In this Standard, "solar heating collectors" are referred to as "collectors".

1.2
The procedures in this Standard are a set of calculations used to evaluate the daily energy production of a collector under a specific set of climatic conditions using existing test results.

1.3
The calculated energy production rating values are valid when the collectors are operating with the fluid type and flow rate used during thermal performance testing.

1.4
The procedures in this Standard are applicable to the following types of collectors:
(a) glazed tubular collectors;
(b) glazed flat-plate collectors; and
(c) unglazed flat-plate collectors.

1.5
The procedures in this Standard can also be used to calculate the energy production rating for other types of collectors tested in accordance with Section 4.1, including
(a) concentrating collectors (i.e., heat generation only);
(b) transpired air collectors;
(c) glazed integral collector storage (ICS);
(d) unglazed ICS; and
(e) thermosyphon collectors.